AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the

application:

LISTING OF CLAIMS:

1.   (Currently Amended):   A method for providing QoS in a wireless network communicating through a point-to-point network, the method comprising:

(a) at least one of intermediate nodes and a receiving node, selecting at least one QoS management node among different nodes within a predetermined range which are not included on a forwarding route, the forwarding route reaching from a transmitting node to the receiving node via at least one intermediate node satisfying QoS requirements;

(b) the selected QoS management node, managing QoS management information of the different nodes which are not included on the forwarding route; and

(c) the QoS management node, changing the forwarding route on the basis of the QoS management information so that the changed forwarding route passes through a different node satisfying the QoS requirements, if it is expected that at least one intermediate node existing on the forwarding route will not satisfy the QoS requirements,

wherein (c) comprises:

(c1) the at least one intermediate node existing on the forwarding route, requesting a route change to the QoS management node if its own QoS information exceeds a predetermined threshold value;

(c2) the QoS management node receiving the route change request, selecting a node among the different nodes which are not included on the forwarding route, which optimally satisfy QoS requirements, on the basis of the QoS management information; and

(c3) the QoS management node, changing the forwarding route so that the changed forwarding route passes through the selected node.

2.   (Original): The method of claim 1, wherein (a) comprises:

(a1) at least one of the intermediate nodes and the receiving node on the forwarding route, analyzing expected lifetime information of the different nodes which are not included on the forwarding route, the expected lifetime information received when the forwarding route is set;

(a2) at least one of the intermediate nodes and the receiving node on the forwarding route, selecting as the QoS management node a node with a longest expected lifetime among the different nodes; and

(a3) at least one of the intermediate nodes and the receiving node on the forwarding route, notifying the node selected as the QoS management node that the node has been selected as a QoS management node.

3.   (Original): The method of claim 1, wherein (b) comprises:

(b1) the selected QoS management node, requesting QoS information from the different nodes which are not included on the forwarding route; and

(b2) receiving QoS information of the different nodes which are not included on the forwarding route, and updating the QoS management information including a list of nodes satisfying QoS requirements and QoS information of the respective nodes.

4.   (Original): The method of claim 3, wherein (b) further comprises:

(b3) the QoS management node, broadcasting a QoS information request to search for a new node which is not included on the forwarding route, if no node among the different nodes receiving the QoS information satisfies the QoS requirements; and

(b4) updating the QoS management information if QoS information of the new node which is not included on the forwarding route is received.

5.   (Original): The method of claim 4, wherein (b) further comprises:

(b5) the QoS management node, exchanging the QoS management information with a different QoS management node and updating the QoS management information.

6.   (Cancelled):

7.   (Original): The method of claim 1, wherein the QoS requirements in (a) include at least one information among delay, jitter, throughput, transmission power, remaining power,

maximal values and minimal values for the respective information, and set weights for the respective information.

8.   (Original): The method of claim 2, wherein in (a1), the forwarding route is set in a manner that a route request message including the QoS requirements is broadcasted to all nodes within a predetermined range until a route request message has reached the receiving node, and the receiving node receiving the route request message transmits a route response message to the transmitting node via an intermediate node existing on a shortest route satisfying the QoS requirements.

9.   (Original): The method of claim 8, wherein the route request message includes expected lifetime information of a transmitting node and QoS requirements information, as a message for searching for a shortest route satisfying the QoS requirements.

10.   (Original): The method of claim 8, wherein the route response message includes information for the shortest route satisfying QoS requirements and QoS information of the intermediate node existing on the shortest route, as a message for notifying a route searching result for setting a forwarding route to the transmitting node.

11.   (Original):   The method of claim 2, wherein in (a1), the expected lifetime information is calculated based on a present remaining power and is calculated according to the equation:

E = P/M,

wherein E is a value for the expected lifetime information, P is a present remaining power of a corresponding node, M is a numeral of a transmitting/ receiving message, and if calculation of the numeral of the transmitting/receiving message is not possible at the time, the present remaining power of the corresponding node is calculated quantitatively.

12.   (Original): A wireless communication system communicating through a point-to-point network, which provides QoS, the wireless communication system comprising:

a transmitting node, which searches for a forwarding route satisfying QoS requirements and communicates with a receiving node;

a receiving node, which searches for the forwarding route satisfying the QoS requirements, communicates with a transmitting node, and selects at least one QoS management node among different nodes which are not included on the forwarding route;

at least one intermediate node, which exists on a forwarding route from the transmitting node to the receiving node as a node satisfying the QoS requirements, and selects at least one QoS management node among different nodes which are not included in the forwarding route; and

at least one QoS management node, the intermediate node selecting the QoS management node among the different nodes which are not included on the forwarding route, which manages QoS management information of the different nodes, and changes the forwarding route on the

basis of the QoS management information, so that the changed forwarding route passes through a different node satisfying the QoS requirements, if it is expected that the intermediate node does not satisfy the QoS requirements.

13.   (Currently Amended): A transmitting node of a wireless communication system communicating via a point-to-point network, the transmitting node comprising:

a route setting unit, which searches for a forwarding route which reaches from the transmitting node to a receiving node via an intermediate node satisfying QoS requirements; and

a data communication unit, which forwards data to the receiving node through the forwarding route set by the route setting unit,

wherein the route setting unit broadcasts a route request message including the QoS requirements to all nodes within a predetermined range from the transmitting node to the receiving node, receives a route response message via at least one intermediate node on a shortest route satisfying the QoS requirements from the receiving node, and sets the forwarding route,

wherein the route request message is a message for searching for the shortest route satisfying the QoS requirements and includes expected lifetime information and QoS requirements information of a transmitting node.

14.   (Canceled).

15.   (Cancelled):

16.   (Currently Amended):   A receiving node of a wireless communication system communicating through a point-to-point network, which provides QoS, the receiving node comprising:

a route setting unit, which sets a forwarding route which reaches from a transmitting node to the receiving node via at least one intermediate node satisfying the QoS requirements; and

a QoS manager selection unit, which selects at least one QoS management node among different nodes which are not included on the forwarding route,

wherein the QoS manager selection unit analyzes expected lifetime information of different nodes which are not included on the forwarding route, the expected lifetime information being received by transmission node existing on the forwarding route when the forwarding route is set; selects a node with a longest expected lifetime among the different nodes as a QoS management node; and notifies the selected node that the node is selected as a QoS management node.

17.   (Original):   The receiving node of claim 16, wherein the route setting unit receives a route request message including the QoS requirements, transmits a route response

message to the transmitting node via at least one intermediate node existing on a shortest route satisfying the QoS requirements, and sets the forwarding route.

18.   (Original): The receiving node of claim 17, wherein the route response message is a message for notifying a route searching result for setting the forwarding route to the transmitting node, and includes shortest forwarding route information satisfying the QoS requirements and QoS information of respective intermediate nodes on the forwarding route.

19.   (Cancelled):

20.   (Currently Amended): The receiving node of claim [[19]] 16, wherein the expected lifetime information is calculated based on a present remaining power each remaining on the respective nodes, and is calculated according to the equation:

E = P/M,

wherein E is a value for the expected lifetime information, P is a present remaining power of a corresponding node, M is a numeral of a transmitting/receiving message, and if calculation of the numeral of the transmitting/receiving message is not possible at the time, the present remaining power of the corresponding node is calculated quantitatively.

21.   (Currently Amended):   At least one intermediate node of a wireless communication system communicating through a point-to-point network, which provides QoS, the intermediate node comprising:

a QoS manager selection unit, which selects at least one QoS management node among different nodes which are not included on a forwarding route, the forwarding route reaching from a transmitting node to a receiving node via at least one intermediate node satisfying QoS requirements; and

a route change unit, which requests a route change to the QoS management node if it is expected that its own QoS information does not satisfy the QoS requirements,

wherein the QoS manager selection unit analyzes expected lifetime information of the different nodes which are not included on the forwarding route, the expected lifetime information being received by the transmitting node existing on the forwarding route; selects a node with a longest expected lifetime among the different nodes as a QoS management node; and notifies the selected node that the node is selected as a QoS management node.

22.   (Cancelled):

23.   (Currently Amended): The intermediate node of claim [[22]] 21, wherein the expected lifetime information is calculated based on a present remaining power remaining on each of the respective nodes, and is calculated according to the following equation:

E = P/M,

wherein E is a value for the expected lifetime information, P is a present remaining power of a corresponding node, M is a numeral of a transmitting/receiving message, and if the numeral of the transmitting/receiving message cannot be calculated at the time, the present remaining power of the corresponding node is calculated quantitatively.

24.   (Original): The intermediate node of claim 21, wherein the QoS route change unit requests a route change to the QoS management node if QoS information of the intermediate node exceeds a predetermined threshold value.

25.   (Currently Amended):   At least one QoS management node of a wireless communication system communicating through a point-to-point network, which provides QoS, the QoS management node comprising:

a QoS information management unit, which manages QoS information of other nodes which are not included on a forwarding route, the forwarding route reaching from a transmitting node to a receiving node via at least one intermediate node satisfying QoS requirements; and

a route change unit, which changes the forwarding route on the basis of the QoS management information so that the changed forwarding route passes through a different node satisfying the QoS requirement, if it is expected that at least one intermediate node existing on the forwarding route does not satisfy the QoS requirements.

wherein the QoS information management unit:

requests QoS information from the different nodes which are not included on the forwarding route;

receives QoS information of the different nodes which are not included on the forwarding route, and updates QoS management information including a list of nodes satisfying the QoS requirements and QoS information of the respective nodes;

broadcasts a QoS information request to search for at least one new intermediate node which is not included on the forwarding route, if no node among different nodes receiving the QoS information satisfies the QoS requirements;

updates the QoS management information if QoS information of the new intermediate node which is not included on the forwarding route is received; and

exchanges the QoS management information with at least one different QoS management node and updates the QoS management information.

26.   (Cancelled):

27.   (Original):   The QoS management node of claim 25, wherein the QoS management node receives a route change request from at least one intermediate node existing on the forwarding route, and selects a node which optimally satisfies QoS requirements, among different nodes which are not included on the forwarding route, on the basis of the QoS management information, and

the route change unit changes the forwarding route so that the changed forwarding route passes through the node selected by QoS Manager selection unit.